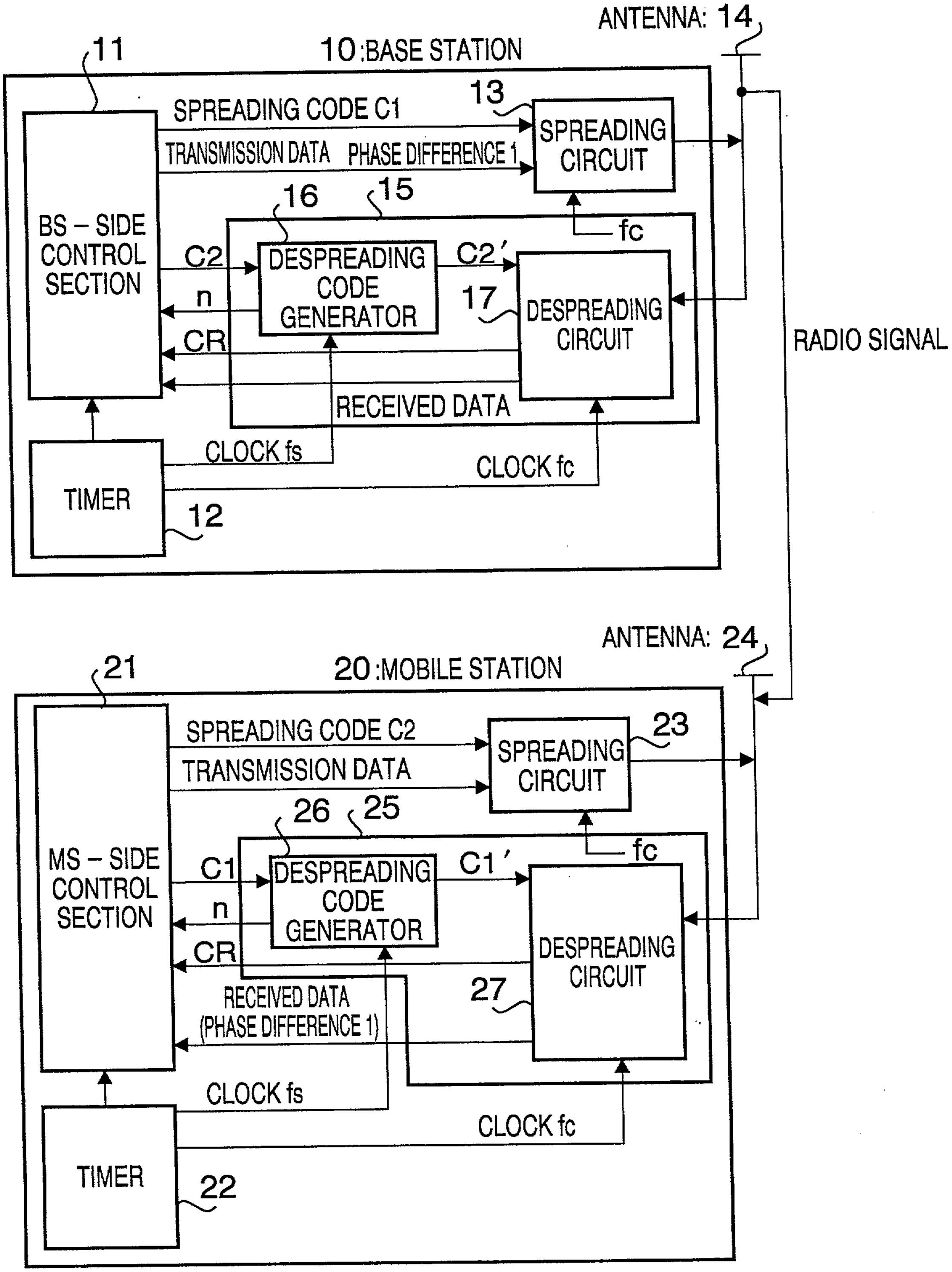
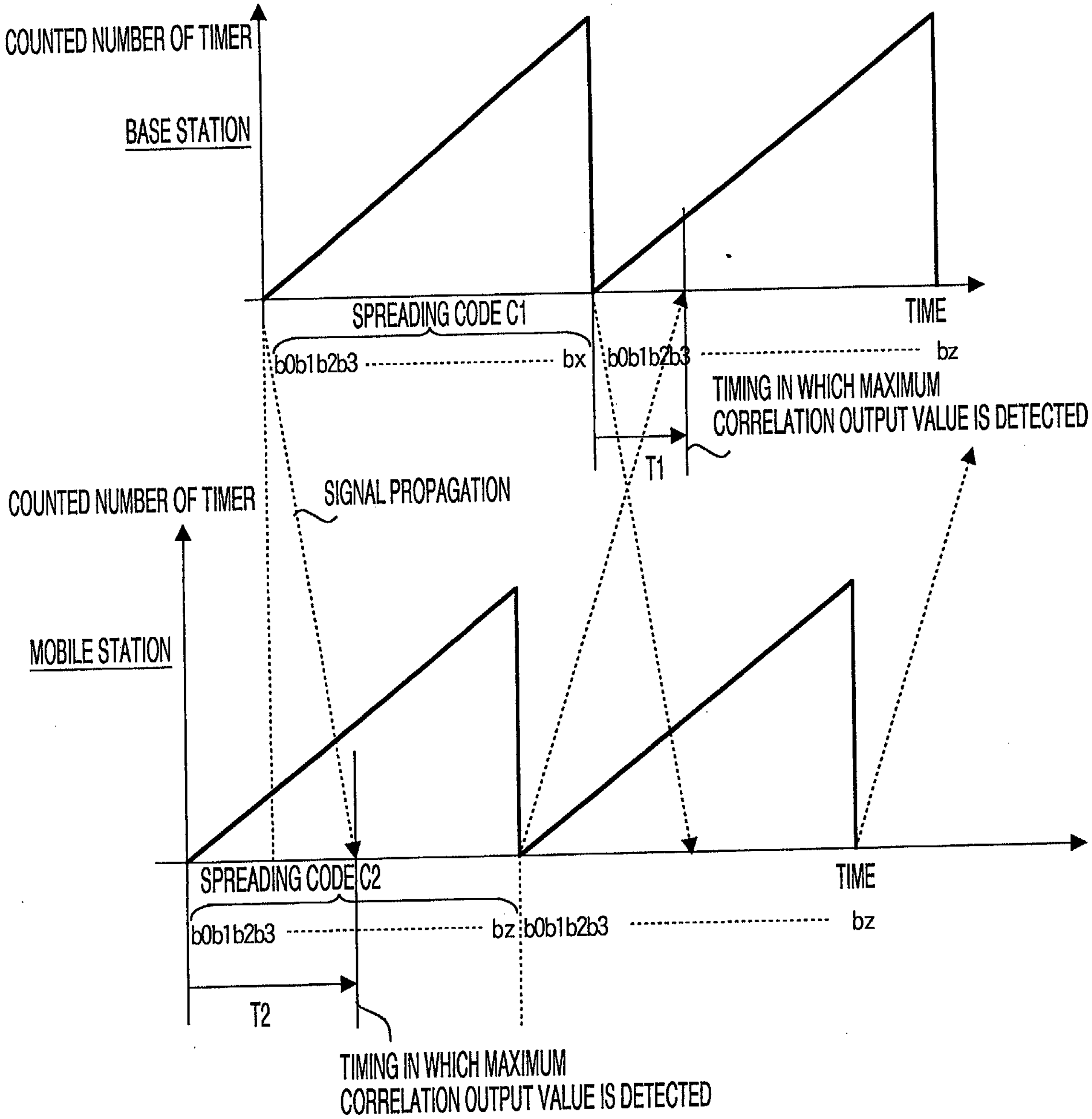


ANTENNA: 14
10:BASE STATION
11
SPREADING CODE C1
13
SPREADING CIRCUIT
TRANSMISSION DATA
PHASE DIFFERENCE 1
16
15
BS – SIDE CONTROL SECTION
C2
DESPREADING CODE GENERATOR
C2′
fc
n
17
DESPREADING CIRCUIT
CR
RADIO SIGNAL
RECEIVED DATA
CLOCK fs
CLOCK fc
TIMER
12
ANTENNA: 24
20:MOBILE STATION
21
SPREADING CODE C2
23
SPREADING CIRCUIT
TRANSMISSION DATA
26
25
MS – SIDE CONTROL SECTION
C1
DESPREADING CODE GENERATOR
C1′
fc
n
CR
DESPREADING CIRCUIT
RECEIVED DATA (PHASE DIFFERENCE 1)
27
CLOCK fs
CLOCK fc
TIMER
22

FIG. 1

FIG. 2


COUNTED NUMBER OF TIMER
BASE STATION
SPREADING CODE C1
b0b1b2b3 ---------- bx
b0b1b2b3 ---------- bz
TIME
TIMING IN WHICH MAXIMUM CORRELATION OUTPUT VALUE IS DETECTED
T1
SIGNAL PROPAGATION
COUNTED NUMBER OF TIMER
MOBILE STATION
SPREADING CODE C2
b0b1b2b3 ---------- bz
b0b1b2b3 ---------- bz
TIME
T2
TIMING IN WHICH MAXIMUM CORRELATION OUTPUT VALUE IS DETECTED

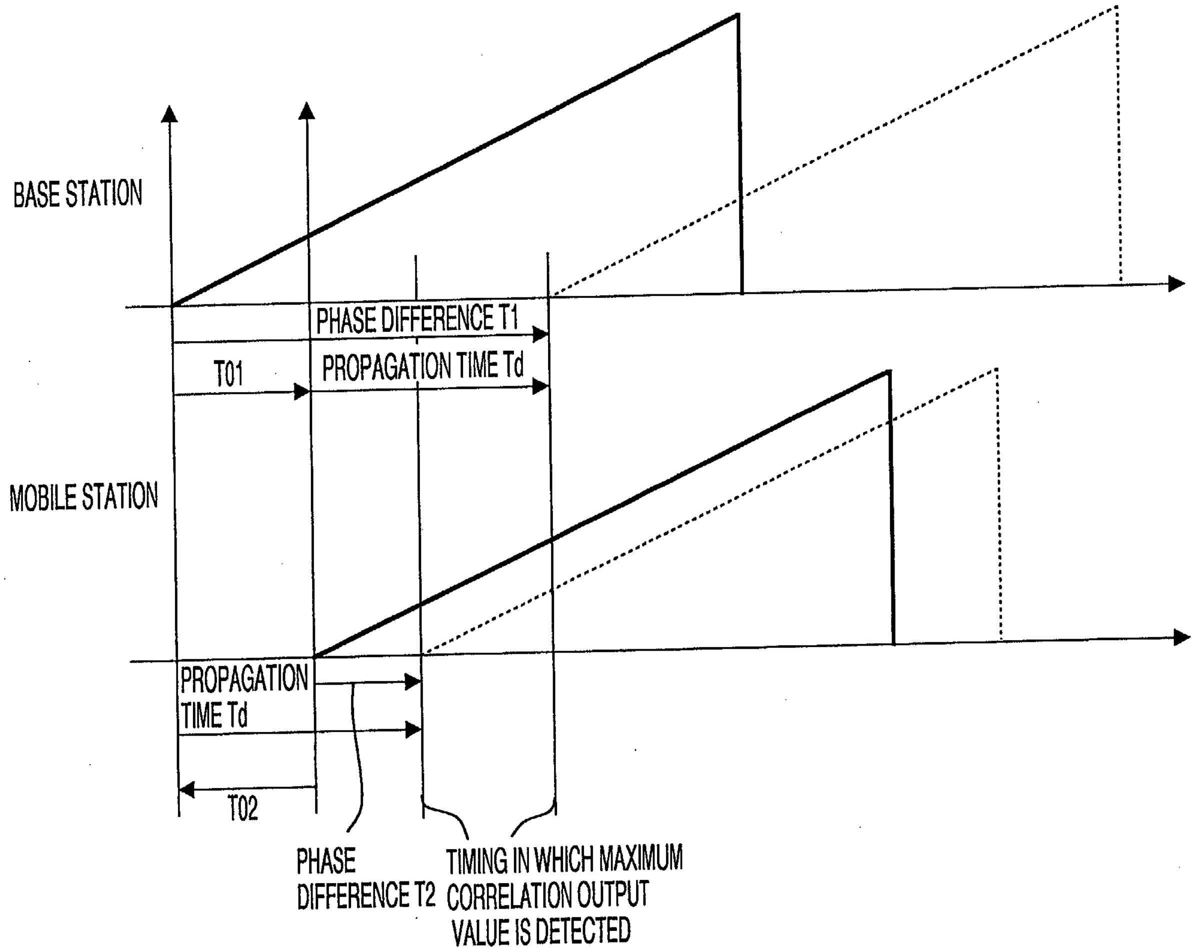

BASE STATION
MOBILE STATION
PHASE DIFFERENCE T1
T01
PROPAGATION TIME Td
PROPAGATION TIME Td
T02
PHASE DIFFERENCE T2
TIMING IN WHICH MAXIMUM CORRELATION OUTPUT VALUE IS DETECTED

FIG. 3

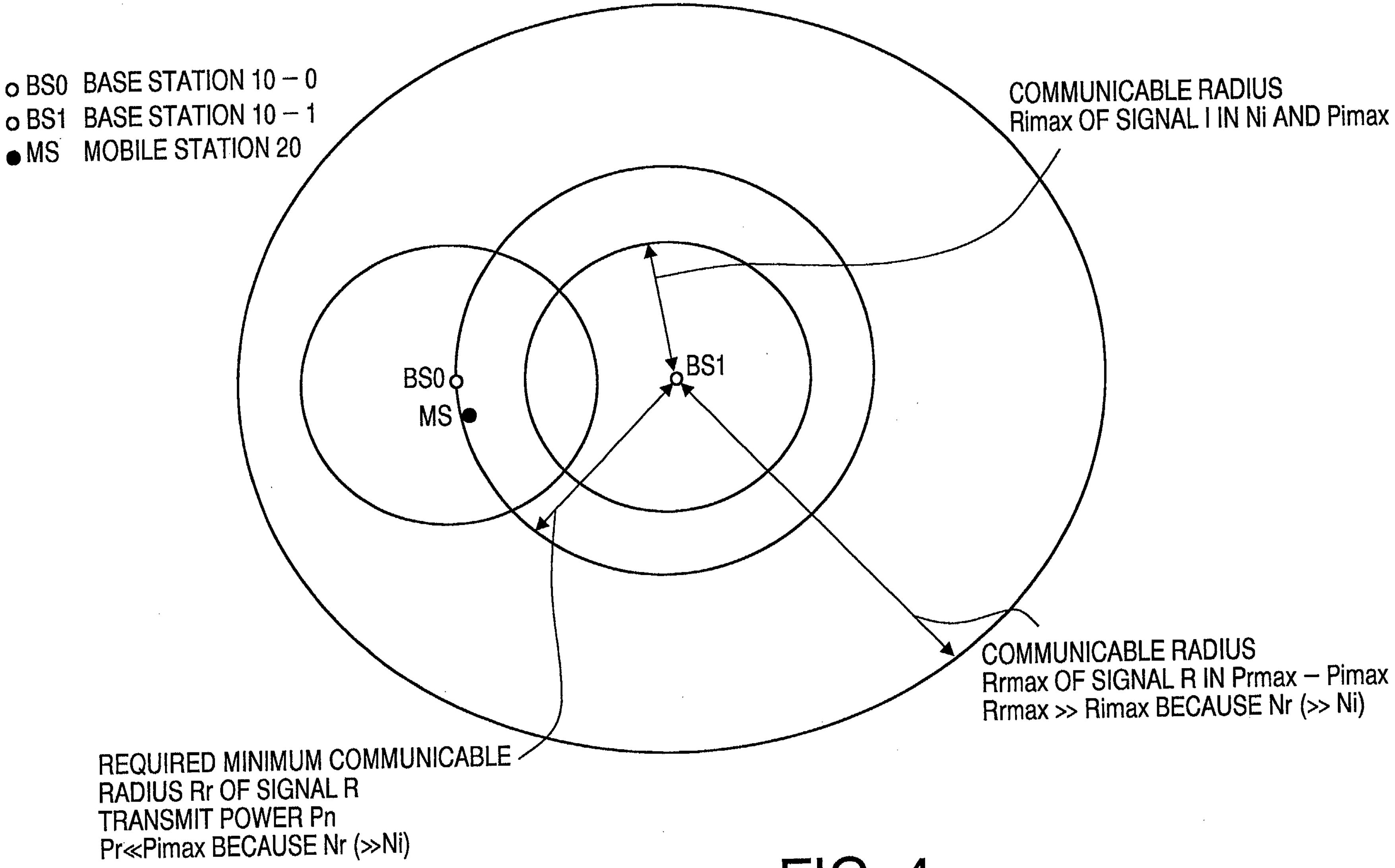

○ BS0 BASE STATION 10 – 0
○ BS1 BASE STATION 10 – 1
● MS MOBILE STATION 20
COMMUNICABLE RADIUS
Rimax OF SIGNAL I IN Ni AND Pimax
BS0
MS
BS1
COMMUNICABLE RADIUS
Rrmax OF SIGNAL R IN Prmax – Pimax
Rrmax >> Rimax BECAUSE Nr (>> Ni)
REQUIRED MINIMUM COMMUNICABLE
RADIUS Rr OF SIGNAL R
TRANSMIT POWER Pn
Pr≪Pimax BECAUSE Nr (>>Ni)

FIG. 4

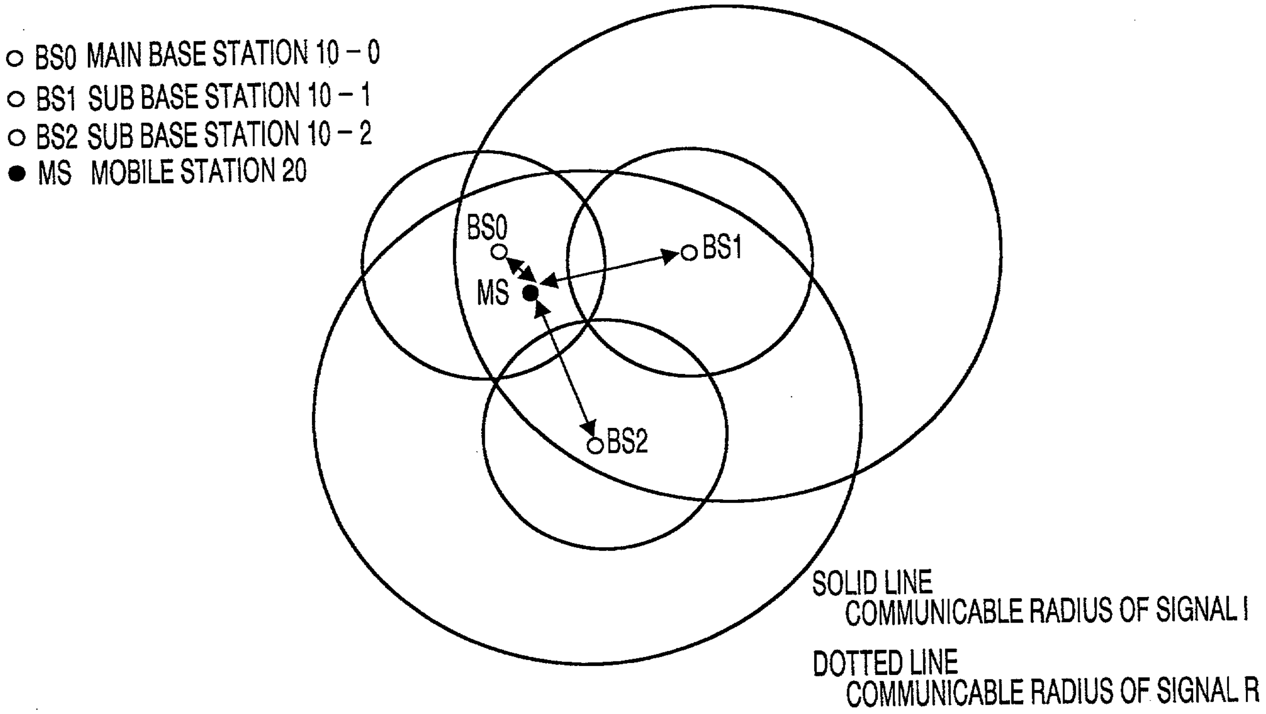

○ BS0 MAIN BASE STATION 10 – 0
○ BS1 SUB BASE STATION 10 – 1
○ BS2 SUB BASE STATION 10 – 2
● MS MOBILE STATION 20
BS0
MS
BS1
BS2
SOLID LINE
COMMUNICABLE RADIUS OF SIGNAL I
DOTTED LINE
COMMUNICABLE RADIUS OF SIGNAL R

FIG. 5

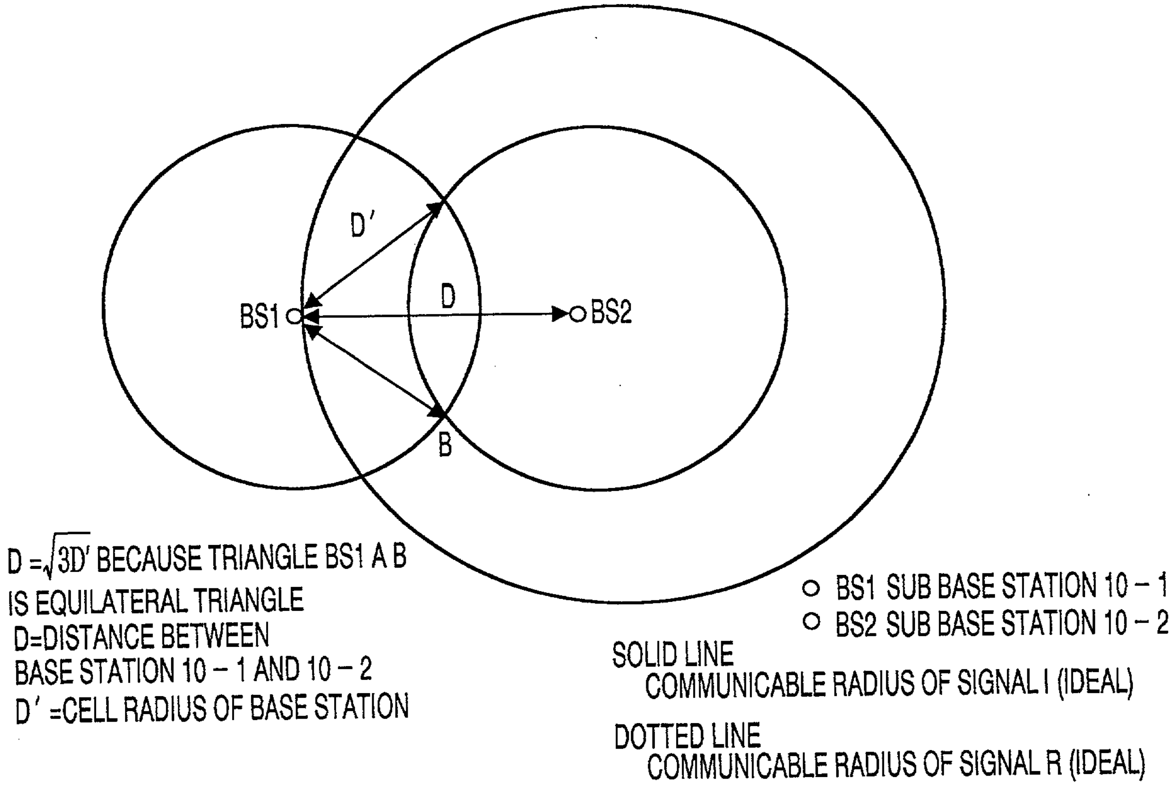
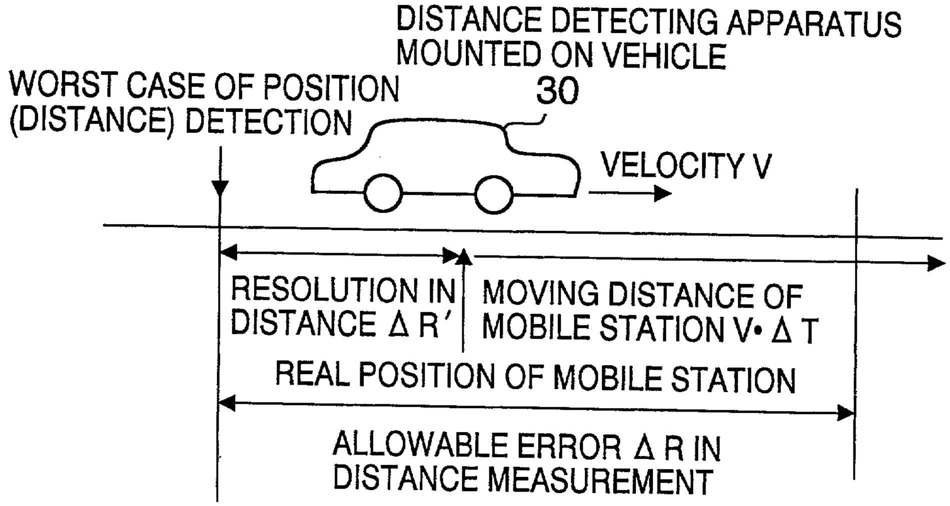

D′
D
B
BS1
BS2
D =√3D′ BECAUSE TRIANGLE BS1 A B
IS EQUILATERAL TRIANGLE
D=DISTANCE BETWEEN
BASE STATION 10 – 1 AND 10 – 2
D′ =CELL RADIUS OF BASE STATION
○ BS1 SUB BASE STATION 10 – 1
○ BS2 SUB BASE STATION 10 – 2
SOLID LINE
COMMUNICABLE RADIUS OF SIGNAL I (IDEAL)
DOTTED LINE
COMMUNICABLE RADIUS OF SIGNAL R (IDEAL)

FIG. 6



WHEN Δ T>(Δ R − Δ R′) V,ERROR IN DISTANCE MEASUREMENT BY MOBILE STATION MAY EXCEED ALLOWABLE ERROR Δ R IN DISTANCE MEASUREMENT
POSITION DETECTION SHOULD BE PERFORMED DURING PERIOD SHORTER THAN Δ T

FIG. 7